CANCELLED per A Sub to B4

WHAT WE CLAIM IS:

~~1. A DNA sequence selected from the group~~ consisting of the DNA inserts of G-pBR322(Pst)/HFIF1, G-pBR322(Pst)/HFIF3, G-pBR322(Pst)/HFIF-6, G-pBR322(Pst)/HFIF7, DNA sequences which hybridize to any of the foregoing DNA inserts and DNA sequences, from whatever source obtained, including natural, synthetic or semi-synthetic sources, related by mutation, including single or multiple, base substitutions, deletions, insertions and inversions to any of the foregoing DNA sequences or inserts.

CANCELLED per A

2. A DNA sequence according to claim 1 wherein said DNA sequence which hybridizes to said DNA insert is selected from the group consisting of the DNA inserts of G-pPLa-HFIF-67-12, G-pPLa-HFIF-67-12Δ19, G-pPLc-HFIF-67-8, DNA sequences which hybridize to any of the foregoing DNA inserts, DNA sequences, from whatever source obtained, including natural, synthetic or semi-synthetic sources, related by mutation, including single or multiple, base substitutions, deletions, insertions and inversions to any of the foregoing DNA sequences or inserts, and DNA sequences comprising sequences of codons which on expression code for a polypeptide displaying similar immunological or biological activity to a polypeptide coded for on expression of the codons of any of the foregoing DNA sequences and inserts.

CANCELLED per A

3. A DNA sequence according to claim 1 or 2 wherein said DNA sequence which hybridizes to said DNA insert is selected from the group consisting of G-pPLa-HFIF-67-12Δ279I, G-pPLa-HFIF-67-12Δ218M1, G-pPLa-HFIF-67-12ΔM1, G-pPLa-HFIF-67-12Δ19 BX-2, DNA sequences which hybridize to any of the foregoing DNA sequences, DNA sequences, from whatever source obtained, including natural, synthetic, or semi-synthetic sources, related by mutation, including single or multiple, base substitutions, deletions, insertions and inversions, to any of the foregoing DNA sequences and DNA sequences comprising sequences of codons which on expression code for a polypeptide

similar in immunological or biological activity to a polypeptide coded for on expression of any of the foregoing DNA sequences.

4. A DNA sequence according to anyone of claims 1 to 3 wherein said DNA sequence which hybridizes to said DNA insert is the DNA insert of p[325]-gHFIF-4, DNA sequences which hybridize to the foregoing DNA sequence, DNA sequences, from whatever source obtained, including natural, synthetic, or semi-synthetic sources, related by mutation, including single or multiple, base substitutions, deletions, insertions and inversions, to the foregoing DNA sequences and DNA sequence comprising sequences of codons which on expression code for a polypeptide similar in immunological or biological activity to a polypeptide coded for on expression of the foregoing DNA sequence.

5. A DNA sequence according to any one of claims 2 to 4 characterized in that it is selected from the group consisting of DNA sequences of the formula: ATGACCAACAAG
TGTCTCCTCCAAATTGCTCTCCTGTTGTGCTTCTCCACTACAGCTCTTTCCATGAGC
TACAACTTGCTTGGATTCCTACAAAGAAGCAGCAATTTTCAGTGTCAGAAGCTCCTG
TGGCAATTGAATGGGAGGCTTGAATACTGCCTCAAGGACAGGATGAACTTTGACATC
CCTGAGGAGATTAAGCAGCTGCAGCAGTTCCAGAAGGAGGACGCCGCATTGACCATC
TATGAGATGCTCCAGAACATCTTTGCTATTTTCAGACAAGATTCATCTAGCACTGGC
TGGAATGAGACTATTGTTGAGAACCTCCTGGCTAATGTCTATCATCAGATAAACCAT
CTGAAGACAGTCCTGGAAGAAAAACTGGAGAAAGAAGATTTCACCAGGGGAAAACTC
ATGAGCAGTCTGCACCTGAAAAGATATTATGGGAGGATTCTGCATTACCTGAAGGCC
AAGGAGTACAGTCACTGTGCCTGGACCATAGTCAGAGTGGAAATCCTAAGGAACTTT
TACTTCATTAACAGACTTACAGGTTACCTCCGAAAC, ATGAGCTACAACTTGCTT
GGATTCCTACAAAGAAGCAGCAATTTTCAGTGTCAGAAGCTCCTGTGGCAATTGAAT
GGGAGGCTTGAATACTGCCTCAAGGACAGGATGAACTTTGACATCCCTGAGGAGATT
AAGCAGCTGCAGCAGTTCCAGAAGGAGGACGCCGCATTGACCATCTATGAGATGCTC
CAGAACATCTTTGCTATTTTCAGACAAGATTCATCTAGCACTGGCTGGAATGAGACT
ATTGTTGAGAACCTCCTGGCTAATGTCTATCATCAGATAAACCATCTGAAGACAGTC
CTGGAAGAAAAACTGGAGAAAGAAGATTTCACCAGGGGAAAACTCATGAGCAGTCTG
CACCTGAAAAGATATTATGGGAGGATTCTGCATTACCTGAAGGCCAAGGAGTACAGT
CACTGTGCCTGGACCATAGTCAGAGTGGAAATCCTAAGGAACTTTTACTTCATTAAC
AGACTTACAGGTTACCTCCGAAAC and derivatives thereof, said

fragments and derivatives coding for polypeptides displaying an immunological or biological activity of IFN-β.

6. A recombinant DNA molecule characterized by a DNA sequence according to any one of the preceding claims.

7. The recombinant DNA molecule according to claim 6, characterized in that said DNA sequence is operatively linked to an expression control sequence.

8. The recombinant DNA molecule according to claim 7, characterized in that said expression control sequence is selected from the group consisting of a lac system, a β-lac system, a trp system, major operator and promotor regions of phage λ, the control region of fd coat protein, and other sequences which control the expression of genes of prokaryotic or eukaryotic cells and their viruses.

9. The recombinant DNA molecule according to claim 7 or 8 selected from the group consisting of G-pPLa-HFIF-67-12, G-pPLa-HFIF-67-12Δ19, and G-pPLa-HFIF-67-8.

10. The recombinant DNA molecule according to claim 7 or 8 characterized in that it is selected from the group consisting of G-pPLa-HFIF-67-12Δ279T, 6-pPLa-HFIF-67-12Δ218M1, 6-pPLa-HFIF-67-12ΔM1, and G-pPLa-HFIF-67-12Δ19 BX-2.

11. A host transformed with at least one recombinant DNA molecule, said recombinant DNA molecule being selected from the group consisting of recombinant DNA molecules according to any one of claims 6 to 10.

12. The host of claim 11 selected from the group consisting of strains of E. coli, Pseudomonas, Bacillus subtilis, Bacillus stearothermophilus, other bacilli, yeasts, other fungi, mouse or other animal or plant hosts and human tissue cells.

13. The transformed host according to claim 11 or 12 selected from the group consisting of E. coli HB101 (G-pBR322(Pst)/ HFIFI), E. coli HB101 (G-pBR322(Pst)/HFIF3), E. coli HB101 (G-pBR322(Pst)/HFIF6) and E. coli HB101 ~~(G-pBR322(Pst)/HFIF7).~~

~~14. The transformed host according to claim 11~~ or 12 selected from the group consisting of E.coli M5219 (G-pPLa-HFIF-67-12), E.coli K12ΔHI (G-pPLa-HFIF-67-12), E.coli M5219 (G-pPLa-HFIF-67-12Δ19), E.coli M5219 (G-pPLc-HFIF-67-8) and E.coli K12ΔHI (G-pPLa-HFIF-67-8)

~~15.~~ The transformed host according to claim 11 and 12 characterized in that it is selected from the group consisting of E.coli M5219 (G-pPLa-HFIF-67-12Δ279T), E.coli M5219 (pPLa-HFIF-67-12Δ218Ml), E.coli M5219 (pPLa-HFIF-67-12ΔMI), E.coli K12ΔHI (pPLa-HFIF-67-12Δ19 BX-2).

~~16. A polypeptide or fragments and derivatives~~ thereof displaying an immunological or biological activity of human fibroblast interferon produced by the transformed host according to any one of ~~claims~~ 11 to 15.

17. A polypeptide characterized in that it is coded for by a DNA sequence according to any one of claims 1 ~~to 5.~~

18. A polypeptide or fragments and derivatives thereof according to claim 16 or 17 and being IFN-β.

~~19. A polypeptide or fragments and derivatives~~ thereof according to any one of claims 16 to 18 characterized in that it is selected from the group consisting of polypeptides of the formula: Met-Thr-Asn-Lys-Cys-Leu-Leu-Gln-Ile-Ala-Leu-Leu-Leu-Cys-Phe-Ser-Thr-Thr-Ala-Leu-Ser-Met-Ser-Tyr-Asn-Leu-Leu-Gly-Phe-Leu-Gln-Arg-Ser-Ser-Asn-Phe-Gln-Cys-Gln-Lys-Leu-Leu-Trp-Gln-Leu-Asn-Gly-Arg-Leu-Glu-Tyr-Cys-Leu-Lys-Asp-Arg-Met-Asn-Phe-Asp-Ile-Pro-Glu-Glu-Ile-Lys-Gln-Leu-Gln-Gln-Phe-Gln-Lys-Glu-Asp-Ala-Ala-Leu-Thr-Ile-Tyr-Glu-Met-Leu-Gln-Asn-Ile-Phe-Ala-Ile-Phe-Arg-Gln-Asp-Ser-Ser-Ser-Thr-Gly-Trp-Asn-Glu-Thr-Ile-Val-Glu-Asn-Leu-Leu-Ala-Asn-Val-Tyr-His-Gln-Ile-Asn-His-Leu-Lys-Thr-Val-Leu-Glu-Glu-Lys-Leu-Glu-Lys-Glu-Asp-Phe-Thr-Arg-Gly-Lys-Leu-Met-Ser-Ser-Leu-His-Leu-Lys-Arg-Tyr-Tyr-Gly-Arg-Ile-Leu-His-Tyr-Leu-Lys-Ala-Lys-Glu-Tyr-Ser-His-Cys-Ala-Trp-Thr-Ile-Val-Arg-Val-Glu-Ile-Leu-Arg-Asn-Phe-Tyr-Phe-Ile-Asn-Arg-Leu-Thr-Gly-Tyr-Leu-Arg-Asn, Met-Ser-

CANCELLED per A

Tyr-Asn-Leu-Leu-Gly-Phe-Leu-Gln-Arg-Ser-Ser-Asn-Phe-Gln-
Cys-Gln-Lys-Leu-Leu-Trp-Gln-Leu-Asn-Gly-Arg-Leu-Glu-Tyr-
Cys-Leu-Lys-Asp-Arg-Met-Asn-Phe-Asp-Ile-Pro-Glu-Glu-Ile-
Lys-Gln-Leu-Gln-Gln-Phe-Gln-Lys-Glu-Asp-Ala-Ala-Leu-Thr-
Ile-Tyr-Glu-Met-Leu-Gln-Asn-Ile-Phe-Ala-Ile-Phe-Arg-Gln-
Asp-Ser-Ser-Ser-Thr-Gly-Trp-Asn-Glu-Thr-Ile-Val-Glu-Asn-
Leu-Leu-Ala-Asn-Val-Tyr-His-Gln-Ile-Asn-His-Leu-Lys-Thr-
Val-Leu-Glu-Glu-Lys-Leu-Glu-Lys-Glu-Asp-Phe-Thr-Arg-Gly-
Lys-Leu-Met-Ser-Ser-Leu-His-Leu-Lys-Arg-Tyr-Tyr-Gly-Arg-
Ile-Leu-His-Tyr-Leu-Lys-Ala-Lys-Glu-Tyr-Ser-His-Cys-Ala-
Trp-Thr-Ile-Val-Arg-Val-Glu-Ile-Leu-Arg-Asn-Phe-Tyr-Phe-
Ile-Asn-Arg-Leu-Thr-Gly-Tyr-Leu-Arg-Asn, and polypeptides from whatever source obtained related to any of the foregoing polypeptides by mutation, including single or multiple, base substitutions, deletions, insertions and inversions, to any of the DNA sequences which code for them.

37 CFR 1.663

CANCELLED per A (3) 68

20. A method for producing a recombinant DNA molecule characterized by the step of introducing into a cloning vehicle a DNA sequence according to any one of claims 1-5.

CANCELLED per A

21. The method according to claim 20 characterized by the additional step of introducing into said cloning vehicle an expression control sequence according to claim 8, said expression control sequence being introduced into said cloning vehicle so as to control and to regulate the expression of said DNA sequence.

per A

22. A method for transforming a host characterized by the step of introducing into a host a recombinant DNA molecule according to any one of claims 6 to 10.

per A 37 CFR 1.663

23. A method for producing a polypeptide displaying an immunological or biological activity of human fibroblast interferon, characterized by the steps of transforming an appropriate host with a recombinant DNA molecule according to any one of claims 8 to 10; culturing said host, and collecting said polypeptide.

CANCELLED per A

~~24. The method according to claim 23, characterized in that the host is selected from the group consisting of strains of E. coli, Pseudomonas, Bacillus subtilis, Bacillus stearothermophilus, other bacilli, yeasts, fungi, animal or plant hosts, and human tissue cells.~~

CANCELLED per A 37 CFR 1.663

25. A method for producing a polypeptide displaying an immunological or biological activity of human fibroblast interferon characterized by the steps of culturing a host transformed by a recombinant DNA molecule according to any one of claims 8 to 10 and collecting said polypeptide.

per A Subt B'

26. A process for selecting a DNA sequence coding for a polypeptide displaying an immunological or biological activity of HuIFN-β from a group of DNA sequences characterized by the step of determining which of said DNA sequences hybridizes to a DNA sequence according to any one of claims 1-5.

CANCELLED per A

27. The process of claim 26 wherein said DNA sequence screened is selected from the group consisting of DNA sequences from natural sources, synthetic DNA sequences, DNA sequences from recombinant DNA molecules and DNA sequences which are a combination of any of the foregoing DNA sequences.

CANCELLED 37 CFR 1.663 per A

28. A composition for treating human viruses or treating human cancers or tumors characterized by at least one polypeptide selected from the group consisting of the polypeptides, according to any one of claims 16 to 18.

~~29. A composition for treating bovine viral infections characterised by at least one polypeptide selected from the group consisting of polypeptides, according to any one of claims 16 to 18.~~

NF 29/3/89

CANCELLED per A 37 CFR 1.663

~~29.~~30. A method for treating human viruses or treating human cancers or tumors characterized by the step of administering to said humans in a pharmaceutically acceptable manner an effective amount of a composition ~~according to claim 28.~~

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~~91. A method for treating bovine viral infections characterised by the step of administering to said animals in a pharmaceutically acceptable manner an effective amount of a composition according to claim 29.~~

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CANCELLED per A

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~~30. A polypeptide or fragments or derivatives thereof~~ coded for by a DNA sequence that does not hybridize to a DNA sequence according to any one of claims 1 to 5 and which displays an immunological activity of IFN-β, ~~which activity is destroyed by antisera to Escherichi IFN-β.~~

Add C'

CANCELLED claims 1-15, 19-30 per A

ADDED CLAIMS 31-37 per A

Add B'